

METADATA FOR THE 2004 STANISLAUS COUNTY LAND USE SURVEY DATA

Originator:

California Department of Water Resources

Date of Metadata:

September 1, 2005

Abstract:

The 2004 Stanislaus County land use survey data set was developed by DWR through its Division of Planning and Local Assistance. The data was gathered using aerial imagery and extensive field visits, the land use boundaries and attributes were digitized, and the resultant data went through standard quality control procedures before finalizing. The land uses that were gathered were detailed agricultural land uses, and lesser detailed urban and native vegetation land uses. The data was gathered and digitized by staff of DWR's San Joaquin District and the quality control procedures were performed jointly by staff at DWR's DPLA headquarters from San Joaquin District.

The finalized data include DWG files (land use vector data) and shape files (land use vector data).

Purpose:

This data was developed to aid in DWR's efforts to continually monitor land use for the main purpose of determining the amount of and changes in the use of water.

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Data Development:

1. The majority of the county was surveyed with aerial digital imagery purchased from AIRPHOTOUSA. The imagery, natural color and orthorectified with a 2 foot resolution, was collected November of 2002. These images were converted to quad sized files with a 3 meter resolution. The remainder of the county used USGS, 1 meter, black and white digital orthophoto quads dated from the early 1990's.
2. The images were used in the spring of 2004 to develop the land use boundaries that would be used in the survey. The land use boundaries were taken from the 1996 Stanislaus County survey, and edited as appropriate with the newer imagery.
3. These images and land use boundaries were copied onto laptop computers that were used as the field collection tools. The staff took these laptops in the field and virtually all the areas were visited to positively identify the land use. The site visits occurred in July through September 2004. Land use codes were digitized directly into the laptop computers using AUTOCAD (and a standardized digitizing process) any land use boundaries changes were noted and corrected back in the office.
4. After quality control/assurance procedures were completed on each file (DWG), the data was finalized for the summer survey.
5. Satellite imagery (Landsat 7) from March 2004 was used to further process the data. The dairy industry is large in Stanislaus County. DWR wanted to capture the acreage that is planted to wheat in the winter and green-chopped in the spring (April). DWR made an assumption that the fields that were identified as either corn or fallow in the summer would be the only fields that could have green-chop wheat grown on them in the winter.

Using summer identified wheat fields as wheat training sites, and fields that were "visibly" fallow in the spring (using the March imagery) as fallow training sites, an image-wide classified scene was created. The classified pixels within the summer identified corn and fallow fields were sampled and identified by whichever had the higher percentage of pixels. For instance, if a corn field had 82 percent of the pixels within it classified as wheat in the spring (meaning that 18 percent, or the remaining pixels, were classified as fallow), we added a wheat attribute to that field. That field changed from a single crop of corn to a double crop of green-chopped wheat followed by corn.

After performing this work, it was determined that there were tomato fields and dry bean fields that had crops grown in them also. Using similar techniques, each of these fields was changed to a double crop, with either grain or a truck crop ("T") as the first crop.

A final county wide shapefile was created that incorporated the satellite image identified spring crops.

Data Accuracy:

The land use boundaries were drawn on-screen in AUTOCAD using the digital orthophoto quads as a backdrop. The resultant digital line work for those areas is 50 foot accuracy.

The land use attribute accuracy is very high, because almost every delineated field was visited by a surveyor. The accuracy is less than 100 percent because some errors must have occurred. There are three possible sources of attribute errors which are:

- 1) Misidentification of land use in the field (and digitizing that incorrect attribute in the laptop computer); or
- 2) Correct identification of land use, but digitizing an incorrect attribute in the laptop computer.

Projection Information:

The data (DWG and shape files) are in a transverse mercator projection, with identical parameters to UTM projections, except the central meridian is -120 degrees (120 degrees west). For comparison, UTM 10 has a central meridian of 123 degrees west, and UTM 11 has a central meridian of 117 degrees west. This projection allows virtually all of the geographic area of California to be in one 6 degree zone (as opposed to two zones, UTM 10 and 11).

Projection:	Transverse Mercator
Datum:	NAD27
Units:	Meter
Scale Reduction:	0.9996
Central Meridian:	120 degrees west
Origin Latitude:	0.00 N
False Easting:	500,000
False Northing:	0.00

Land Use Attributes:

All land use attributes were coded using the Department's Standard Land Use Legend dated March 1999 (98legend.pdf). The legend explains in detail how each delineated area is attributed in the field, and what the coding system is.

The actual land use coding given in the legend is different in arrangement than the codes that result from the digitizing process. The file attributes.pdf is a detailed explanation of the coding system from the legend and the codes that end up in digitized form in the database files associated with the shape files.

Information on the AUTOCAD (DWG) Files:

The land use data is available in AUTOCAD 12 format by quad, with one file per quad. The file naming convention is 04SSXXXX.DWG, where XXXX is the DWR quadrangle number. For example, file 04SS3828.DWG is the AUTOCAD drawing file for the 2004 Stanislaus County land use survey for quadrangle 3828 (the Newman quad).

Every quadrangle file has identical layers, nomenclature, and line colors. They are as follows:

Layer	Description	Color
0	AutoCAD's default layer	White
CQN	California DWR quad number	Cyan
GSN	USGS quad number	Cyan
LUB	Land use boundary lines	Yellow
LUC	Land use codes for GRASS	White
LUT	Visible land use text	Green
QB	The quad's boundary	White
QN	Quad name	Cyan

Following is an explanation of the attributes (for each delineated area) in the LUC layer of each quad file:

ACRES:	Number of acres in the delineated area (may or may not be present)
WATERSOURC:	The type of water source used for the delineated area
MULTIUSE:	Type of land uses within the delineated area
CLASS1:	The class for the first land use
SUBCLASS1:	The subclass for the first land use
SPECOND1:	The special condition for the first land use
IRR_TYP1:	Irrigated or non-irrigated, and irrigation system type for the first land use
PCNT1:	The percentage of land associated with the first land use
CLASS2:	The class for the second land use
SUBCLASS2:	The subclass for the second land use
SPECOND2:	The special condition for the second land use
IRR_TYP2:	Irrigated or non-irrigated, and irrigation system type for the second land use
PCNT2:	The percentage of land associated with the second land use
CLASS3:	The class for the third land use
SUBCLASS3:	The subclass for the third land use
SPECOND3:	The special condition for the third land use
IRR_TYP3:	Irrigated or non-irrigated, and irrigation system type for the third land use
PCNT3:	The percentage of land associated with the third land use

Information on the Shape Files:

Shape files were created for each quad, and one for the whole survey area. The naming convention used for the quad DWG files is used for the quad shape files (for example, 04SS3828.shp, 04SS3828.shx, and 04SS3828.dbf for quad number 3828, the Newman quad). The name of the shape file for the whole survey area is 04SS.shp (and .dbf and .shx). The name of the shape file for the whole survey area including the spring crops found using satellite imagery is 04SSint.shp (and .dbf and .shx). The following is an explanation of the land use attributes in the DBF files:

BL_X:	This is the X coordinate of the interior point in the delineated area
BL_Y:	This is the Y coordinate of the interior point in the delineated area
ACRES:	Number of acres in the delineated area (may or may not be present)
WATERSOURC:	The type of water source used for the delineated area
MULTIUSE:	Type of land uses within the delineated area
CLASS1:	The class for the first land use
SUBCLASS1:	The subclass for the first land use
SPECOND1:	The special condition for the first land use
IRR_TYP1A:	Irrigated or non-irrigated for the first land use
IRR_TYP1B:	Irrigation system type for the first land use
PCNT1:	The percentage of land associated with the first land use
CLASS2:	The class for the second land use
SUBCLASS2:	The subclass for the second land use
SPECOND2:	The special condition for the second land use
IRR_TYP2A:	Irrigated or non-irrigated for the second land use
IRR_TYP2B:	Irrigation system type for the second land use
PCNT2:	The percentage of land associated with the second land use
CLASS3:	The class for the third land use
SUBCLASS3:	The subclass for the third land use
SPECOND3:	The special condition for the third land use
IRR_TYP3A:	Irrigated or non-irrigated for the third land use
IRR_TYP3B:	Irrigation system type for the third land use
PCNT3:	The percentage of land associated with the third land use
UCF_ATT:	Concatenated attributes from MULTIUSE to PCNT3

Important Points about Using this Data Set:

1. The land use boundaries were drawn on-screen using orthorectified imagery. They were drawn to depict observable areas of the same land use. They were not drawn to represent legal parcel (ownership) boundaries, or meant to be used as parcel boundaries.
2. This survey was created as a "snapshot" in the summer, and further improved by the addition of spring crops found through the use of satellite imagery.

There still could be fields where there were crops grown before or after the field survey. The surveyor may not have been able to detect them from the field or the photographs, and the satellite imagery processing may not have identified the spring crop. Thus, although the data is very accurate for the summer, and probably the spring, it may not be an accurate determination of what was grown in the fields for the whole year.

3. If the data is to be brought into a GIS for analysis of cropped (or planted) acreage, two things must be understood:
 - a. The acreage of each field delineated is the gross area of the field. The amount of actual planted and irrigated acreage will always be less than the gross acreage, because of ditches, farm roads, other roads, farmsteads, etc. Thus, a delineated corn field may have a GIS calculated acreage of 40 acres but will have a smaller cropped (or net) acreage, maybe 38 acres.
 - b. Double and multicropping must be taken into account. A delineated field of 40 acres might have been cropped first with grain, then with corn, and coded as such. To estimate actual cropped acres, the two crops are added together (38 acres of grain and 38 acres of corn) which results in a total of 76 acres of net crop (or planted) acres.
4. Water source information was not collected for this survey.
5. Not all land use codes will be represented in each survey.